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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/014,681	12/11/2001	Michael Anthony Klug	M-8577-3D US	4374
33031	7590	01/25/2006	EXAMINER	
CAMPBELL STEPHENSON ASCOLESE, LLP 4807 SPICEWOOD SPRINGS RD. BLDG. 4, SUITE 201 AUSTIN, TX 78759			BOUTSIKARIS, LEONIDAS	
			ART UNIT	PAPER NUMBER
			2872	

DATE MAILED: 01/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/014,681	Applicant(s) KLUG ET AL.	
	Examiner Leo Boutsikaris	Art Unit 2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 36-41, 57 and 64 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 36-41, 57 and 64 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 39-41, 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kihara (US 5,949,559) in view of Zabka (US 5,223,955).

Regarding claims 39, 57, Kihara discloses a system and a method for recording holographic stereograms, the system comprising (Figs. 3A, 3B):

a light source 31 for producing a coherent beam L1;

a beam splitter 33 that splits the coherent beam into an object beam L4 and a reference beam L3;

a material holder 50 holding a holographic recording material 30 having elemental holograms;

an object beam unit (Fig. 3B) for displaying a rendered image and for conditioning the object beam with the rendered image to interfere with the reference beam at a chosen elemental hologram;

a computer programmed to control the interference of the object beam L4 and the reference beam L3 and the delivery of the image to the object beam unit (line 15, col. 3 to line 33, col. 6).

However, Kihara's system lacks a lens located in the path of the object beam, between the condensing lens 43 and the holographic material 30, and proximate to the holographic material, the lens being used to control the size of the elemental hologram being recorded and make the rendered image appear to be further away from the holographic recording material. Zabka discloses a system for recording a sequence of elemental holograms in holographic material 53, wherein an additional lens 47 is placed between the condensing lens 43 and the holographic material 53 (Figs. 1, 7a, 8a, lines 4-12, col. 6). The purpose of the second lens 47 is to change the apparent depth of the field view as well as the size of the hologram (as affecting the focus of the system), see lines 9-12, col. 6, and 60-61, col. 7. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a second lens between the condensing lens and the holographic material in Kihara's system, as taught by Zabka, for achieving easy focus control, flexibility and enhancement of image fidelity (see lines 4-12, col. 6 in Zabka).

Regarding claims 40-41, the optical system of Kihara also includes an SLM 41 for displaying an image. However, Kihara in view of Zabka does not specify the focal length of the second, voxel control lens located between the condensing lens 43 and the holographic material 30. It would have been obvious to one of ordinary skill in the art to use such a lens with focal length approximately equal to its distance from the SLM or the image of the SLM, since it has been held that discovering an optimum value of a result effective variable involves only routine

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skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Here, the result effective variable is the focal length of the lens. The above arrangement is common in Fourier holography.

Claims 36-38, 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kihara (US 5,949,559) in view of Kasazumi (US 5,317,435) and Benton (US 4,834,476).

Regarding claims 36-38, and as described above, Kihara discloses all the limitations of said claim, including the limitation that the system comprises a diffuser 42 disposed in the object beam path and a masking plate 44 disposed in the object beam path. However, Kihara does not teach that the diffuser may have a deterministic phase pattern designed to diffuse light in at least one of a specific pattern and a specific direction, or that the masking plate is disposed in the reference beam path.

Kasazumi discloses a holographic recording system wherein a diffuser 200 is disposed in the object beam path (Fig. 3a), the diffuser comprising a deterministic phase pattern (Fig. 3c), and designed to diffuse light in a specific direction (line 55, col. 5 to line 19, col. 6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a diffuser of the kind taught by Kasazumi in the system of Kihara, for achieving holographic image recording of high quality with little speckle noise (see lines 21-24, col. 6 in Kasazumi).

Benton discloses a system for recording holographic stereograms, wherein the two recording beams are in a transmission geometry, and an aperture 28 is placed in the path of the reference beam (as well as in the path of the object beam), see Fig. 1. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the system of Kihara

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in a transmission geometry, thus placing a masking plate in the path of the reference beam, since the two recording geometries are equivalent structures known in the art (as evidenced by Benton). The choice of the recording geometry depends on the specifics of the desired performance characteristics, such as diffraction efficiency etc.

It is noted that the diffuser and the masking plate act in concert to allow exposure of a particular hogel, and that the diffuser is band-limited since it is designed to act on laser light of a specific wavelength band. Finally, even though Kihara does not explicitly teach that the diffuser and the masking plate are removable and possess positioning adjustment devices, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make said components removable, since it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art. *Nerwin v. Erlichman*, 168 USPQ 177, 179. The ability to move the diffuser and the masking plate allows for a desired diffusion effect as well as for a choice of a hogel of a desired size.

Regarding claim 64, it is noted that the diffuser and the masking plate in Kihara's system are positioned so that they can be replaced by respective second diffuser and masking plate, the latter pair producing one of a larger, smaller or differently shaped elemental hologram.

Response to Applicant's Arguments

Applicant's arguments filed on 11/14/2005 have been fully considered but they are not persuasive.

Regarding claims 39, 57, Applicant argues that Zabka's lens 47 is not capable of varying the size of a hogel or making the rendered image as appear at a greater distance relative to the

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holographic recording material. The examiner respectfully disagrees and notes that even though Zabka did not specifically state the above two effects of positioning a lens close to the holographic material and moving said lens in concert with another lens (Zabka only mentioning that said lens effects depth of field and providing more flexibility), it is submitted that one of the results of placing a lens close to the holographic material is to affect the object light incident onto the holographic material and therefore *necessarily* affect the size of the recorded hogel (since the hogel is nothing more than the interference of the reference beam with the object beam). The other result of placing the lens close to the holographic material is to affect the position of the virtual image of the SLM element.

Regarding claim 36 Applicant argues that the diffuser in Kasazumi is not removable, band-limited or designed for a wavelength corresponding to a wavelength of the coherent beam used for the holographic recording. The examiner cannot agree. First, as described above, long established case law suggests that patentability of an invention cannot be based solely on the removability of an element. Second, it is submitted that if an optical element such as a diffuser is *designed* to operate in concert with light of a specific wavelength (as evidenced by the disclosure of the diffuser comprising a specific phase pattern, see Fig. 3c, the phase of the light being transmitted through the diffuser uniquely depending on the operational wavelength), then *by definition* this represents spectral action from the diffusion that is band-*limited*, i.e., the diffuser does not work according to the design with light of any other wavelength. Finally, it is noted that the whole design of the diffuser, i.e., the phase pattern of Fig. 3c is based on the knowledge of the operational wavelength, i.e., the wavelength of the light that is going to be used for the recording of the hologram.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Leo Boutsikaris whose telephone number is 571-272-2308.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LEONIDAS BOUTSIKARIS
PRIMARY EXAMINER

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January 21, 2006